An Epistemological Literature Review on Knowledge and Knowledge Management

Thomas Trautmann

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Thomas TRAUTMANN

Département de Stratégie et POM
Groupe ESC Grenoble

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Pour plus d'informations :
For further information:
Rahim BAH
Groupe ESC Grenoble
12 Rue Pierre Sémard
38003 Grenoble Cedex 01
rahim.bah@esc-grenoble.fr

ABSTRACT

Knowledge Management is among the most fashionable subjects in the industry. Unfortunately what is Knowledge and what is Knowledge Management is not properly knowN in most of companies. This implies confusion for those who would like to start to apply Knowledge Management and most of the time sets in a quite confusing position the newly named "Knowledge Management Officer".

The purpose of this working paper is to extract from the literature on Knowledge Management an understandable set of definitions to get a clear understanding of Knowledge Management. First of all Knowledge is defined because it is not possible to talk about Knowledge Management without a clear understanding of its base. It is also important to define properly the vocabulary that will be used and avoid confusion with words like "information" and "data". Some Knowledge Management project examples will be listed to provide a link from theory to practical corporate problems.

RESUME

La Gestion de la Connaissance (aussi appelée Knowledge Management dans la plupart des milieu industriels) est actuellement l'un des sujets les plus en vogue au sein du monde industrie l. Hélas un usage exact des mots "Connaissance" et de l'expression "Gestion des connaissances" font défaut la majeure partie du temps. Cette mauvaise utilisation engendre la confusion au sein des entreprises désireuses de se lancer dans l'aventure de la Gestion des Connaissances et place, le plus souvent, le "Responsable de la Gestion des Connaissance" récemment promu dans une situation peu enviable.
Le but de ce papier de recherche est d'extraire de la nombreuse littérature sur le sujet un ensemble compréhensible de définitions afin de fournir une approche claire de ce que peut être la Gestion des Connaissances. La notion de connaissance est définie afin de poser une base saine pour la suite du papier. Il est également important de définir correctement le vocabulaire employé afin d'éviter toute confusion avec des mots tels qu' "information" et "données". Une liste d'exemples de projets d'application concrets de la gestion des connaissances au sein de l'entreprise est fournie afin de tirer un lien entre la théorie et la réalité du monde industriel.

INTRODUCTION

Comparing the market value of the Microsoft share to its assets value shows that the share holders place more than 80% of the company value in its intangible assets; that is for a large part in the company Knowledge (Sveiby, 1997). But what is company Knowledge? Before even drawing the picture of this concept, it is necessary to understand and have a definition of Knowledge. In the current Knowledge Management literature there is no real definition of Knowledge. Each one has its own epistemology and assumes that it is the same for every one. In the first section, with the help of the current literature, it will be demonstrated that this is not the case and that each epistemology is unique and different. With a definition of Knowledge it will be possible to discuss organisational; only then will the reader get a first approach to Knowledge Management. This paper is a literature review and does not intend to provide concise and precise "to do" for Knowledge Management but more a clear understanding of the current theoretical base.

DEFINITIONS

Humans are able to explore space, they nearly know everything about the earth, the oceans, the atom etc… But there is one "grey" box that still keeps most of it secrets: the Brain. We use it every day but still have no complete idea on the overall working process. My interest and my strong engineer and research background in the brain, led me to a first research, Trautmann & Denoeux (1994, 1995), Trautmann (1995), on artificial neural networks, more specifically on an unsupervised learning model called Self Organising Feature Maps developed by T.Kohonen (1983). Artificial Neural Network models, describing the neural cell exchanges in a mathematical framework, can be described as microscopic level, in comparison to the human interactions that can be described as Macroscopic. The purpose of my new research is focused on Knowledge Management in a social structure: the company. As a parallel, I invite the reader to imagine the employee as a neural cell, a group of employees as a somatotopic map (associative area of neural brain cells) of the human brain and the company as the brain. In the following section the reader will be taken through the definitions of *Knowledge, and Knowledge Management.* As literature offers a wide variety of definitions based on the personal interpretations and experiences of each writer it is necessary to restate those. This definition setting will also help the reader to learn the

proper vocabulary and move forward to a more applied field: the identification and selection of a relevant research subject on Knowledge Management for Hewlett-Packard.

A broad range of papers address Knowledge and Knowledge Management. In most of them the authors assume that the reader is aware of the Knowledge and Knowledge Management (KM) definitions. It starts to become quite tricky to find clear and easy to understand definitions for these two fields. The next sections present a literature review of existing definitions and summarise them into single definitions for each concept..

I. Knowledge

A. Introduction

The purpose of this section is to review the existing definitions of Knowledge. It will not explore overall Knowledge theory (*epistemology)* (Bower and Hilgard (1981), Nonaka &Takeuchi (1995), Polanyi (1983)); nor its history (Muzumdar (1997), Nonaka & Takeuchi (1995), Provost (1998)) as this has already been done. It is first necessary to define "data", "information", and "Knowledge", because they are different, although some writers like Toffler (1990) use these words interchangeably.

B. Literature review/Definitions

Knowledge, data and information are three different terms. The following section will present these three words.

1. Information/Data/Knowledge

The differences between data, information and Knowledge will be distinguished like Van Krogh, Roos, Slocum (1994). This distinction is not only for the sake of discussion but is also important for the success of any Knowledge Management projects (Davenport, De Long, Beers, 1998). Davenport & Prusak (1998) define data as "a set of discrete, objective facts about events". A good comparison is to use "computer" vocabulary and compare data

to the binary digits that a computer processes. At a biological level data can be compared to the neuro-transmitters that move from one brain cell to the next one.

Literally, information means "to put" data "in form". Bateson (1979) states that "Information consists of differences that make a difference". Information provides a new point of view making previously unidentified meanings/relations available. Drucker (1988) once said that information is "data endowed with relevance and support". Similarly Davenport & Prusak (1998) describe information as "a message, usually in the form of a document or an audible or visible communication". They also state, repeating Bateson's definition, that information is "data that makes a difference" because it is meant to change the way the receiver perceives the input. The reader will notice that the difference is very subtle. In a computer information can be compared to a "text file" made of a set of digits placed in such a way that they are readable in the readers language. Information to the brain would be the set of "signals" generated by the cells based on a given neural input. Nonaka & Takeuchi (1995) state that Information "is a necessary medium or material for eliciting and constructing Knowledge". Again we move from one concept to the next with the help of a very subtle difference. The difference between data and information is action; now from information to Knowledge we need "*construction*". Davenport & Prusak (1998) assume that, in an intuitive sense, Knowledge is "more" than data and information. Unlike data and information Knowledge contains judgement.

The first definition presented comes from Webster (1998) dictionary:

1. The fact or condition of knowing something with familiarity gained through experience or association
2. Acquaintance with or understanding of a science, art or technique
3. The fact or condition of being aware of something
4. The range of one's information or understanding
5. The circumstance or condition of apprehending truth or fact through reasoning: cognition

The following definition from Drucker (1988) "Converting data into information thus requires Knowledge"; is one of the most interesting and again shows the subtle evolution from one concept to the next, but does not help to define Knowledge. Nonaka & Takeuchi (1995) developed their definition considering that information is as a flow of messages,

while Knowledge is created by that very flow of information, anchored in the beliefs and commitments of its holder.

Nonaka & Takeuchi (1995) identified three major points to relate information and Knowledge:

1. Knowledge, unlike information, is about beliefs and commitments.
2. Knowledge, unlike information, is about action.
3. Knowledge, like information, is about meaning.

Information will provide a new point of view to interpret events or objects (data). It will affect Knowledge by adding something or restructuring it. Information is a necessary medium or material for eliciting and constructing Knowledge.

What is interesting in this definition is that in the three cited quotes on Knowledge, each one contains a specific action: "belief and commitment", "action" and "meaning". Those are human related. Data and information are both outside the "person" but Knowledge is part of the human person. We can consider data as the words of the language. Information will be the way to use those words to provide some description (take a newspaper as a set of data organised to become information). Here, again, the reader can see that Knowledge is a human related action. Bower & Hilgard (1981) assumed that "Knowledge is defined as learning (erudition) and as familiarity or understanding". For them one of the most engaging issues within the theory of Knowledge is the question of how concepts and Knowledge arise. They describe two opposite statements: *empiricism* (the view that experience is the only source of Knowledge), and *rationalism* (the general philosophical position that reason is the prime source of Knowledge, the only valid basis rather than data, authority, revelation or intuition). Nonaka & Takeuchi (1995) also described this. They assume that Knowledge can be considered as "a dynamic human process of justifying personal belief toward the "truth". Churchman (1971) emphasises the human aspect as he states that conceiving "Knowledge as a collection of informations seems to rob the concept of all its life…Knowledge resides in the user and not in the collection. It is how the user reacts to a collection of information that matters." Applying distinctions allows new Knowledge to develop. This process is called *self-referenciality* (Von Krogh, Roos and Slocum, 1994), and means that the new Knowledge refers not only to past Knowledge but also potential future Knowledge (Luhmann, 1990, Varela, 1979).

Using the news paper example: Knowledge is the impact on our commitments and judgements through personal analyse on the basis of personal experience and beliefs. Davenport & Prusak (1998) define this precisely: "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers". To this we could add Davenport, De Long and Beers' (1998) definition: "Knowledge is information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decision and actions".

All the above definitions are summarised in the following table:

	Experience/ Empiricism	Beliefs/ Commitments	Reasoning/ Judgement	Familiarity /Understanding	Learning	Information	Context	Truth	Personal
Davenport 98			**X**				**X**		
Nonaka 95	**X**	**X**						**X**	
Bower 81				**X**	**X**				
Churchman 71									**X**
Polanyi 83									**X**
Webster 98	**X**			**X**		**X**		**X**	

Table 1 Concepts addressed by author

This table gathers the different concepts addressed by the definitions and how the different authors used them. The reader will notice that no author integrates all of them. This is why a new definition is suggested that will help us to move forward and summarise all the concepts:

*Knowledge **IS***
*The way to provide a framework for evaluating and incorporating new experiences and information **TO REACH** personal truth (perceive, apprehend with clarity or certainty; perceive beyond doubt).*

BASED ON *personal experience, learning (empiricism), beliefs, commitments, judgement, understanding (rationalism)*
WITH *the help of a flow of messages (information)*

Definition 1

As truth is approached through the Knowledge process, "what is Knowledge" to one person is merely a plausible belief to another and only a theory to someone else (Sowell, 1996). Data and information are constantly transferred electronically, but Knowledge seems to travel most trough a human network (Davenport, De Long, Beers, 1998).
Knowledge as a human process can be split along different dimensions.
Let me summarise how the three different words we defined above (data, information and Knowledge) are linked together in the following figure:

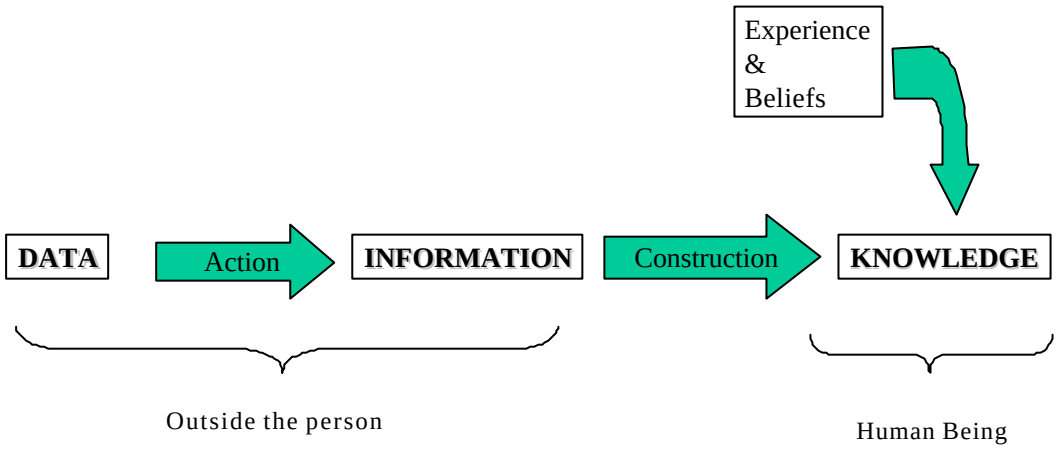

Figure 1 The way from data to Knowledge

2. Knowledge dimensions

"I shall reconsider human Knowledge by starting from the fact that *we can know more than we can tell"*, Polanyi (1983). Polanyi (1974) identified two dimensions, which are highly emphasised in Birchall & Tovstiga (1998), Muzumdar (1997), Nonaka & Takeuchi (1995), and Provost (1998): the TACIT and the EXPLICT dimensions. The epistemological scale will go from one dimension (tacit) to the other (explicit).

a) Tacit

Tacit Knowledge was introduced by Polanyi (1974) and further developed by Polanyi (1983). Nonaka & Takeuchi (1995), based on Polanyi's work define Tacit Knowledge as "personal, context-specific, and therefore hard to formalise and communicate". If you want to learn how to ride a bicycle it is more effective to talk about with someone who knows how to ride a bicycle and experienced it than read about it in books . Tacit Knowledge needs practice and experiment.

b) Explicit

As above Polanyi introduced the explicit dimension. The definition of Explicit Knowledge given by Nonaka & Takeuchi (1995), based on Polanyi's work, is "Explicit or "codified" Knowledge … refers to Knowledge that is transmittable in formal, systematic language".
As Knowledge is transmittable, each person in a group, in our interest a group of people in a company, can transfer part of her/his Knowledge to each other. But as described above the tacit dimension represents the most complicated to transfer. In the opposite the explicit one, as it can be formalised, can be deposited in computer databases, in documents etc… The tacit one will need to express the human context.

Explicit Knowledge is easily transmittable in a group of people, especially in a company, while tacit Knowledge is more difficult to transmit. Interestingly, the move from one dimension to the other is possible and is part of the Knowledge generation process. For Nonaka & Takeuchi (1995) the mobilisation and conversion of tacit Knowledge is the key to Knowledge creation.

They define the connections and the way to transfer Knowledge from one dimension to the other by four interactions called "Knowledge conversion":

1. From tacit to tacit: *socialisation.*
2. From tacit to explicit: *externalisation.*
3. From explicit to explicit: *combination.*
4. From explicit to tacit: *internalisation.*

The following graphic summarises those links:

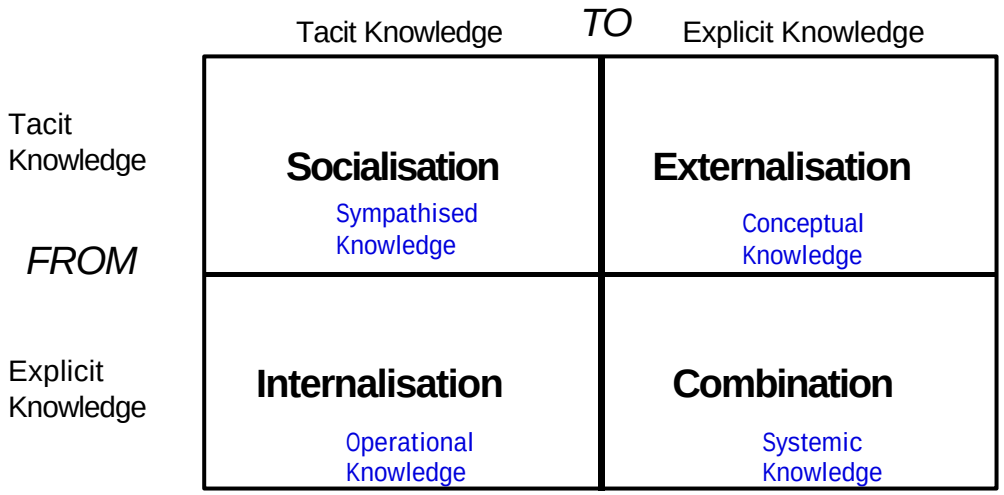

Figure 2 Knowledge conversion (Nonaka and Takeuchi, 1995)

Those four steps can be generalised to more than the individual. Sharing Knowledge, which is providing information to one's peers is essential to the growth of global Knowledge. Like in the brain, when a cell interacts with others (Kohonen, 1984, Trautmann & Denoeux, 1994, 1995, Trautmann, 1995)) there is communication among the people.

3. Conclusion

Knowledge is a human process that needs communication to expand itself. In the frame of the organisation this Knowledge "exchange" will generate organisational Knowledge. The following section will define the Knowledge inside the organisation.

II. Organisational Knowledge

A. Introduction

From the previous section we know now that Knowledge is a human process and that part of it is due to human exchanges and interactions. We can not increase our Knowledge without external input and output. Therefore we can say that Knowledge is a group action. A place to study groups of human is the organisation. In this section I will go through organisational Knowledge.

Nonaka & Takeuchi (1995) described the ways to exchange Knowledge and how this process works from the individual dimension to the inter-organisational dimension. Internationalisation and externalisation are individual-related epistemological dimension changes. Socialisation and combination are Knowledge exchanges related to the ontological dimension as they are linked to the outside environment.

B. Organisation/Group/Individual Knowledge dimension

Davenport & Prusak (1998) stated that Knowledge "In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms". Documents and repositories are the contenders for explicit Knowledge. Most often the organisational routines, processes etc… are the places where one can find the organisation's tacit Knowledge. With this approach the reader will notice that the Knowledge is not only embedded in the employees of the organisation but also in all the other depositories. Organisation members created the depositories in order to transfer their explicit and tacit Knowledge. This is done to help the whole group/organisation to move forward and represents the organisational Knowledge.

From now on it is necessary to differentiate three levels inside the company: the **organisation/company** itself, the **groups** of people working for it (the common way to define this is to talk about: divisions, entities, projects etc…), and the **individuals** (the key assets of the company).

Knowledge will not be the same at those different levels; we have already described the fact that Knowledge is a human action but, through the Knowledge conversion possibilities, it can be pulled forward to the two other levels (the group and the organisation). Organisational Knowledge can be embodied through people (tacit, explicit) or structure (internally, externally focused).

Describing those links is not clearly done in the existing literature as "The connection between the individual level and organisational levels is perhaps the weakest link in the chain of arguments forwarded by organisational learning theorists" (Probst, Buechel & Raub, 1996)

I will now develop the organisational Knowledge concept, which is defined by Von Krogh, Roos and Slocum (1994) as "Knowledge shared by organisational members". It has a multidimensional dimension: content, process, infrastructure, and culture; all of these also have tacit and explicit dimension, (Birchall & Tovstiga, 1998), see figure 3. Organisational Knowledge creation "is the capability of a company as a whole to create new Knowledge, disseminate it throughout the organisation, and embody it in products, services, and systems" (Nonaka & Takeuchi, 1995). The notion for organisational Knowledge has the following properties (Von Krogh, Roos, Slocum, 1994):

(a) It is shared among organisational members

(b) It is scalable and connected to the organisation's history

(c) It both demands and allows for languaging[1]

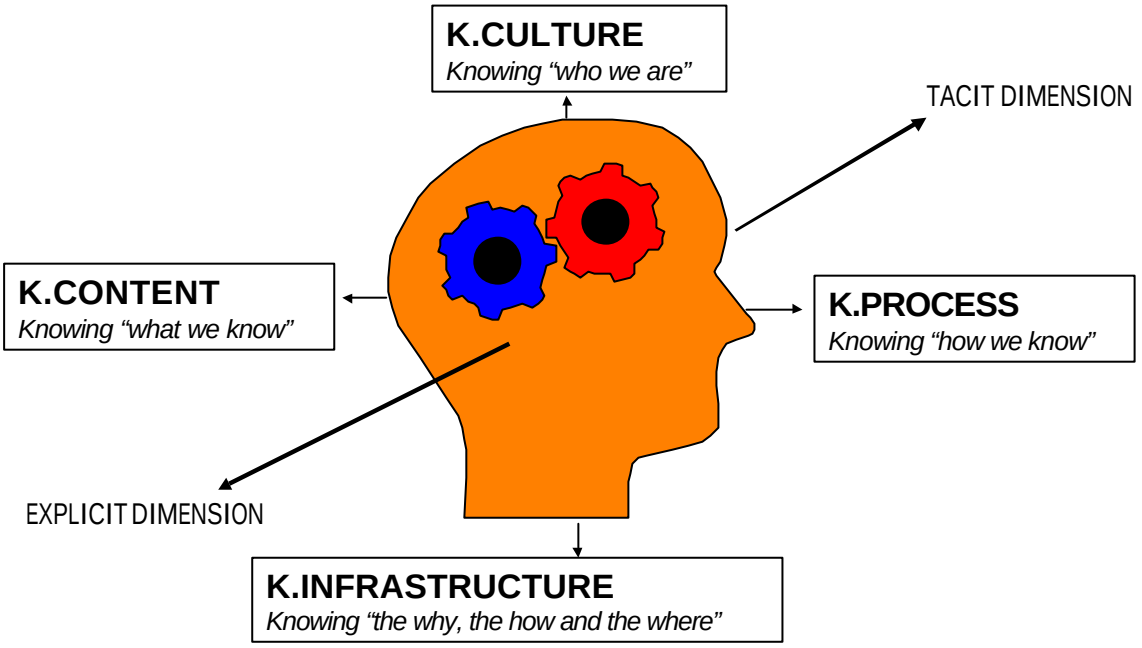

Figure 3 Organisational Knowledge domains and dimensions (Birchall and Tovstiga, 1998)

In comparison to individual Knowledge, organisational Knowledge is highly dynamic, (Davenport & Prusak, 1998). This is emphasised by Von Krogh, Roos, Slocum (1994), they too classify organisational Knowledge as a highly dynamic, 'fragile', and developed trougth a self-referential, simultaneously open and closed process". They also express the interesting fact that since Knowledge of the social system is shared, it is no longer entirely

dependent on specific individuals. Individuals may leave the group but the Knowledge of the group does not vanish (as long as the leaving individual Knowledge was shared among the group members).

Tovstiga and Korot (1998) estimated that half of the firm's Knowledge processes lie in the tacit dimension and that 75% of its infrastructure resides in the explicit one. 70% of the culture is in the tacit dimension. Von Krogh, Roos and Slocum (1994) suggested that the "organisation can be seen as a stream of Knowledge"; in which "individuals have a private Knowledge that can be a basis for organisational Knowledge when conveyed through speaking, gesturing, writing, etc…." They define the Knowledge of the organisation as the Knowledge among the organisational members.

C. Conclusion

The different concepts and definitions that spin around the word "Knowledge" inside the organisation were gathered in this section. In most cases the definitions in the literature are not complete. This is due to the relative complexity of this concept. The epistemology used intends to catch all those different notions in order to provide one full definition (definition 2). The new definition allowed starting the discussion on Knowledge transfer from one individual to another, inside a group, and organisation and inter-organisation. Thus section 2 focused on the Knowledge inside the organisation: the organisational Knowledge.

From now on we know that even if Knowledge is a human dynamic process it also takes place in the organisation and can be embedded as well in the employees as in its different dimensions (process, culture, content and infrastructure).

[1] Languaging refers to the process in which language is not only maintained but is constantly being developed based on previous language.

III. Knowledge Management

A. Introduction

In this section "Knowledge Management" will be defined through a literature review. The human is the only "being" that communicates experience, beliefs, information etc… from one generation to the next. Other animals mainly re-experience what is already. Knowledge has been "managed" at least since the first human learned to transfer the skill of making fire.

B. Literature review/Definitions

The way an organisation deals with its Knowledge has been given different names in the literature: Organisational Knowledge Management, Intellectual Capital Management, Corporate Brainpower, and Intellectual Asset Management. We will use "Organisational Knowledge Management" (shortened in Knowledge Management - KM) in the rest of this document. What exactly is Knowledge Management? Diverse arguments will help us to develop a condensed definition.

"Organisational Knowledge Management is a formalised, integrated approach to identifying and managing an enterprise articulated and tacit Knowledge assets. These Knowledge assets may include Knowledge bases, documents, policies, and procedures as well as unarticulated expertise and experience across the ontological dimension of individuals, groups, organisational, and inter-organisational domains. KM includes the development, implementation, and management of the appropriate organisational infrastructure to enable acquisition, generation, management, and deployment of Knowledge within the enterprise", (Muzumdar, 1997).

In Knowledge Management initiatives the complexity of human factors to be managed is much greater than for most data or information management projects (Davenport, De Long, Beers, 1998). This is due to the fact that, as described in the previous section, unlike data, Knowledge is created in the human brain.

1. Why should an organisation care about Knowledge Management?

Before defining Knowledge Management I would like to cite some quotes that express the importance of Knowledge Management for the company. Even if Knowledge is not a common asset, (like machines, computers, buildings), in our current company management cultures; even if it is difficult to place a value on it, it is now recognised as one of the most important assets.

As quoted by Hamel and Prahalad (1996) "…the race to the future occurs in three distinct, overlapping stages: competition for *industry foresight* and *intellectual leadership,* competition to *foreshorten migration path*". Intellectual leadership is not only related to being the leader in technology but also being the one that can best lever the company Knowledge assets.

Lew Platt, former Hewlett Packard CEO, said a few years ago, before Knowledge Management became the new successful research topic, "If Hewlett-Packard knew what HP knows, we would be three times as profitable". This is emphasised by Drucker (1993) "People-embodied Knowledge has become the only meaningful resource in the new networked society, irrevocably replacing industrial age factors of production such as labour, capital and land." The fact that an organisation is able to generate and disseminate its organisational Knowledge is a first step. It is also necessary to protect its proprietary know-how in products, processes, or other activities in the value chain, it raises barriers" (Porter, 1998).

2. Knowledge Management definitions and summary.

"Knowledge Management is among the core competencies of the organisation" (Hamel and Prahalad, 1990).

Knowledge Management "is the great challenge for every organisation: How do we come to know what we don't know? How can we identify and then transcend, the boundaries to our Knowledge?" (Hamel and Prahalad, 1996). If one wants to start defining Knowledge Management from the base level, that is Knowledge, Knapp (1997) defines Knowledge

Management as “the art of transforming information and intellectual assets into enduring value for an organisation’s clients and its people.” This definition is interesting in that it connects the previous defined concept “Knowledge” to core interest of the organisation: value. Knowledge is the core asset for Knowledge Management in the organisation thus KM is “the collection of processes that govern the creation, dissemination, and utilisation of Knowledge” (Newman, 1991). A very close definition can be found in Nonaka & Takeuchi (1995) “KM is the capacity to create Knowledge, disseminate it through the organisation, capture/embody it in products/services/systems.”

Knowledge Management is action in the organisation. For example (Malhotra, 1998) “Knowledge Management caters to the critical issues of organisational adaptation, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organisational processes that seek synergistic combination of data and information processing capacity of information technologies, and creative and innovative capacity of human beings”. Knowledge Management can then, based on the above quotes, be seen as the way organisations generate, communicate, and leverage their intellectual assets. It is also the broad process of locating, organising, transferring, and using the information and expertise within an organisation.

For the sake of the understanding it is necessary to notice that those actions in the frame of an organisation will help it to move towards “Learning Organisation”. This is also a successful way to define the companies of the future. Garvin (1993) defined Learning Organisations as “organisations skilled at creating, acquiring, and transferring Knowledge, and at modifying their behaviour to reflect new Knowledge and insights”
The above text and quotes are summarised in the following table:

	Creat Knowledge	Disseminate Knowledge	Capture/Embody K	Culture	Process	Infrastructure	Content	Acquisition	Generation	Using	Transforming	Modify Behaviour
Nonaka and Takeuchi (1995)	x	x	x									
Mazumdar (1997)	x	x	x						x	x		
Newman (1991)	x	x	x						x	x		
Garvin (1993)												x
Knapp (1991)											x	
Birchall and Tovstiga (1998)				x	x	x	x					

The following figure summarises the Knowledge Management process as we described it.

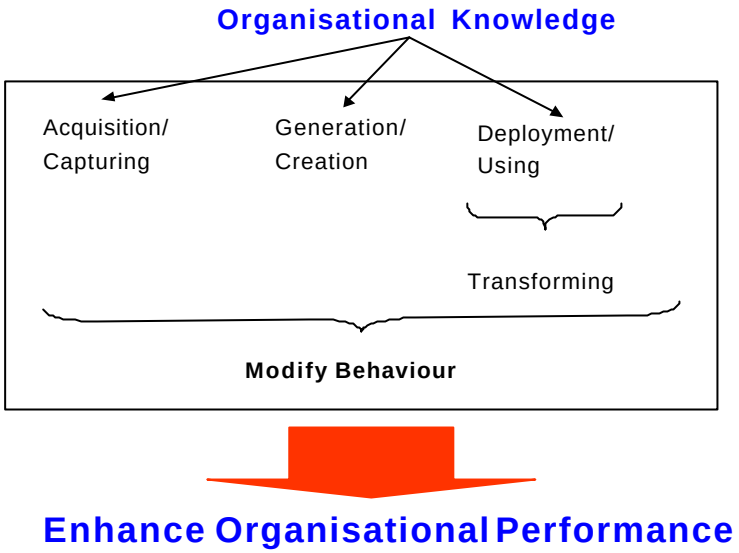

Figure 4 Knowledge Management source and objective through actions

There are four key enablers that support the overall Knowledge Management process: leadership, culture, technology and measurement. "Managing Knowledge effectively involves managing and maintaining a multidimensional perspective, focusing on all four (culture, process, infrastructure, content) domains simultaneously" Birchall & Tovstiga (1998).

3. Knowledge Management and culture.

From the four above key enablers we will focus on the first one: "culture". Due to strong human connection with Knowledge, an organisation that is sensitive to Knowledge Management and its success, needs to have the right organisational climate to persuade people to create, reveal, share, and use their Knowledge.

"The establishment and nurturing of strong, committed, inter-linked communities is what enables effective and efficient intellectual capital management throughout the company" (Huang, 1997). Roos (1996), provided the strong message that what ever the organisation wants to improve there should be a strong managerial commitment. "The company must be mature enough to have gone beyond the stage of discussing business performance solely in financial terms. The company must have a clearly defined business idea or direction. There must be a clear operational commitment to moving ahead which is visibly supported by top-management."

a) KM Examples

Even if Knowledge Management is a very young research topic and focus for organisations, related projects examples exists. Davenport, De Long and Beers (1998) studied thirty-one Knowledge Management projects in twenty-four companies, they also collected data from nine projects in Hewlett-Packard. Data was drawn from interviews with Knowledge projects managers and Knowledge Management function managers across the organisation. Due to the evolving nature of Knowledge Management most of the projects were not finished. They identified four broad types of objectives:

1) Create Knowledge repositories
2) Improve Knowledge access
3) Enhance Knowledge environment
4) Manage Knowledge as an asset.

From this study they extracted eight specific factors that were common to the successful Knowledge projects:

- Link to economic performance or industry value
- Technical and organisational infrastructure
- Standard flexible Knowledge structure
- Knowledge friendly culture
- Clear purpose and language
- Change in motivational practices
- Multiple channels for Knowledge transfer
- Senior management support

As presented it in figure 3 a "Knowledge friendly" culture is one of the most important factors for Knowledge Management project success. Davenport, De Long and Beers (1998) suggest that an organisational culture should have several components with regard to Knowledge:

- People have a positive orientation to Knowledge (employees are bright, intellectually curious, willing and free to explore, and executives encourage their Knowledge creation and use)
- People are not inhibited in sharing Knowledge (they don't fear that sharing Knowledge will cost them their jobs)

- The Knowledge Management project fits with the existing culture

They also provide a list of project management related to the companies area of expertise:

- **High-Tech Manufacturer**: System project management, Research expertise, Product marketing and support, Product Developement Knowledge, etc…
- **Consulting**: Project, Client, Industry and Consulting practice
- **Pharmaceutical**: Drug Development
- **Oil & Gas**: Tacit expert Knowledge
- **Chemicals**: Product application Knowledge, Patented Knowledge
- **Military**: Engagement lessons
- **Automobile**: Competitive intelligence, New car development
- **Advertising/Direct mktg**: Client/Campaign Knowledge
- **National Laboratory**: Nuclear Bomb making
- **Software**: Software dev experts
- **Electronics**: Best practices
- **Bank**: Lessons learned, Best practices
- **Engineering and Construction**: Project designs and plans
- **Insurance**: Intellectual Capital
- **Financial Services**: Office procedure
- **Office equipment**
- **Computer**
- **Biotechnology**
- **Defence**

CONCLUSION

Knowledge Management is not only the topic on vogue it is part of the management methods for future success of companies. Even if its measurement is difficult there is no doubt about its usefulness or its value. The most complicated part of Knowledge Management comes from the human factor, as Knowledge is human. Therefore the company management needs to be the “push” factor for successful Knowledge Management in the company. Pushing employees to share/develop/capture Knowledge needs a strong willing culture. The organisation culture is not the only factor to consider but it is one of the most deeply buried in the company and can be among the most complicated to change if required.

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